



ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

100 years of amateur radio in Colorado

October 2017

PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

Colorado weather is always amazing. We go from the 90's to the 40's just about overnight. But I would not trade that for the happenings in Texas, Florida and the Islands; we just need to appreciate what we have.

What a great attendance for our September meeting! We had very few empty chairs; what a good problem to have. I suspended our usual around the room introductions except for new members and visitors in favor of proceeding with our annual election of board members and officers and getting on with our program. I believe we had 6 or 7 visitors and first timers; I know some of them joined, thanks to those who did. As far as the elections, there were no changes. The four board member positions that were up for election were re-elected to another two year term. The officer line remains the same. I thank the membership for the vote of confidence to be your president for another term. I am sure the other officers echo the same thought.

Thanks to Bill (W6OAV) for a super informative program on Digital Mobile Radio (DMR) and the Brandmeister DMR which is the format used by DRC. A lot of questions were generated and Bill did a great job addressing them. After the information presented is digested, we may want to have Bill back for another session. DMR and Brandmeister are spreading much like the wild fires that have plagued the Western U.S. There is so much information that it is nearly impossible to absorb it all in one session.

Our October program will be another one not to miss. We have scheduled Marty Griffin (WA0GEH) and Jim Langsted (KC0RPS) to discuss Edge of Space Science (EOSS). EOSS is a Denver based non-profit organization that promotes science and education by exploring frontiers in amateur radio and high altitude balloons. EOSS works with university, high school and middle school educators, offering valuable opportunities to enhance their study of science, technology, education and math (STEM). Since 1990, EOSS has launched and recovered over 260 balloon launches. Marty and Jim will be telling us how all this is accomplished. You will find more on this program in the body of this month's Round Table. Mark your calendars now....DON'T MISS THIS PROGRAM!

The club is investigating the possibility and feasibility of moving our Yaesu Fusion repeater to a new location (yet to be determined) for better coverage. I am requesting, if you are a Fusion user, please send me an email about your experience with the present location, if you are using a mobile, HT or both. Moving a repeater is a major undertaking in both time and expense. Your information will be very helpful in decision making. Please send email to W0TX@W0TX.org

Thanks to our new members for making the DRC "Your Club." Please come to meetings and other events and stay active. Your name and call will be listed in this issue of the Round Table.

73 for now,
Gerry (W0GV)
President



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SEPTEMBER MEETING – WHAT'D I MISS?

BY BRENNAN PATE, AD0UZ

As Gerry mentioned in the President’s note, the club had its 2017 election and no changes came about. W0GV, K0HTX, K0TOR and WW0LF were all re-elected. Bill (W6OAV) gave the presentation and provided a clear explanation of DMR and Brandmeister. He addressed the tiers (1,2 (what we use) and 3) how DMR can go from 66 – 960 MHz, with up to a KW of output. He explained how there can be simultaneous conversations on a repeater using the different time slots, how talk groups function and the difference between static and dynamic groups. (As a side note, he did remind everyone to disconnect from the talkgroup when you’re done using it.) Right now there are 733 official talk groups and more developing all the time. He explained that even though DMR was developed for commercial purposes, Hams have found great benefit from fitting it to their needs.



He gave a brief overview of the dashboard at brandmeister.us, color codes, channels, code plugs, and zones. Bill mentioned that it’s better to use the dashboard to see if the time slot is in use rather than tying up the time slot by kerchunking the repeater. Finally, he went over programming channels, contacts, zones, how to scan, how to use the “parrott channel” (9990) and how to hack your firmware with TyMD380toolz found at kg5rki.com. Lastly, there was lengthy Q&A; an indication of the interest piqued.



WHO’S NEW IN THE DRC?

BY BOB WILLSON, KC0CZ

The DRC is a very active club in the Denver metro area and we’d like to have all of our members listen for these new calls and personally to make them feel welcome. Welcome to our newest members:

Ben Baker	KB0UBZ	Robert Dixon	K0VS	John Rushford	KD0FKS
Cathy Villhauer	N0CRZ	James Mc Namee	KE0NRE	Jocelyn McComb	KD0ZVA
Marty Griffin	WA0GEH	Giselle Rushford	-	Stan Trout	WB2SHR
Tyler Kohler	K1WTF				

We have a number of activities throughout the year and we’d like very much for you to participate in serving your community. If you have questions please feel free to ask on any of the repeaters or see the contact information on the last page of this publication. Also, please join us once a month at the regular club meeting on the 3rd Wednesday at 7:00 p.m. For new hams we have the Elmer session which starts at 6:00 p.m. before the regular meeting.

TECHNICAL COMMITTEE REPORT

BY BILL RINKER, W6OAV

The following is an overview of the subjects discussed at the September Technical Committee meeting.

DRC/TSA Aurora Site

Goal: Maintain contact with TSA relative to establishing a "communications room" for the DRC.

Status: A meeting took place with TSA on August 28th. The meeting was positive. WWOLF will put together a letter on what the DRC would propose to install. The TSA is looking at a 6'X12' room for us to set up in.

Station 4 Remote Power Control

Goal: Investigate purchasing and installing Internet controlled power outlets.

Status: The tech committee determined the number of outlets required. KE0HFH has what we need and will get with WG0N to install the outlet strip at Station 4 and test it out. If the test goes well, we'll install the same outlets at Centennial Cone.

Centennial Cone Antenna Radiation Patterns

Goal: Switch antennas and then compare the radiation patterns of 448.625 and the BrandMeister repeaters.

Status: Reports from BrandMeister users confirm a remarkable coverage improvement with the antenna switch. Radio Mobile plots show that the coverage shouldn't have changed that much. WWOLF has a new PolyPhaser which he will install and will also test the systems.

Fusion Repeater Move

Goal: Discuss the feasibility of moving the Fusion repeater to a better coverage location.

Status: A feasibility study is in progress. The Tech Committee is looking for suggestions for sites.

OCTOBER MEETING PRESENTATION

BY MARTY GRIFFIN, WA0GEH

Join us at our October meeting to hear Marty Griffin (WA0GEH) and Jim Langsted (KC0RPS) discuss Edge of Space Sciences (EOSS). EOSS is a Denver, Colorado based non-profit organization that promotes science and education by exploring frontiers in amateur radio and high altitude balloons.

Since its first flight in 1990, EOSS has grown its volunteer membership's numbers and skills over the course of more than 261 launches, ascents into the stratosphere and payload recoveries.

Marty Griffin is a charter member of EOSS and is the EOSS Tracking and Recovery Coordinator. His tracking teams are responsible for a 100% recovery rate over

261 flights.

Jim Langsted is one of our Flight Coordinators and has successfully coordinated many missions for universities, and K-12 students.

EOSS works with university, high school, and middle school educators, offering valuable opportunities to enhance their students' studies of science, technology, engineering and math (STEM) through real, hands-on experience. We provide FAA coordination, launch, tracking and recovery of the payloads. Each year, our volunteers spend thousands of hours to enable student STEM programs to reach the Edge of Space. Hundreds of new, young licensed amateur radio operators have been spawned from these missions.

Since its first flight in 1990, EOSS has grown its volunteer membership's numbers and skills over the course of more than 260 launches, ascents into the stratosphere and payload recoveries. Today, EOSS is widely recognized as one of the premier Amateur Radio High Altitude Balloon (ARHAB) organizations in the world. If you are interested in learning about EOSS and how vital amateur radio is for our success, join us at the DRC October meeting for a PowerPoint presentation addressing the following topics:

- Brief History
- On-board Flight Technology for Tracking and Research
- TrackPoint Tracking Software by Nick Hanks, N0LP
- Amateur Radio Applications for Flight Support
- Educational Partners
- Student Research Payload Examples
- EOSS Operations: Flight Day
- New Challenges
- ADS-B FAA Location Technology
- Payload Development/Maintenance
- 2017 Eclipse Summary, Guernsey, Wyoming
- The Search and Recovery of EOSS 224
- Welcome to visit our next flight, October 21



DRC's 100TH ANNIVERSARY PINS

BY W0TX STORE

If you would like to commemorate the 100th year of the Denver Radio Club then ask about getting your very own commemorative pin. The cost is \$3 for one or two for \$5. They are available at the monthly face-to-face. The picture to the right is a mock up of the pin. They are about 1" tall and 0.75" wide.

**LEARNING NET REPORT**

BY FRED HART, AA0JK

Thanks goes out to our net controllers: Larry (K0LAI), Alex (W2PBR), Steve (KD0WMO) and Jim (KD0MXD). The following topics were discussed this past month:



- Working the Gray Line
- Hurricane communications or lack-there-of, due to solar storm
- Space Weather / Propagation presentation
- Face -to-face meeting. How solar events effect propagation.
- High antenna SWR troubleshooting.
- Yaesu FTDX 1200 Low Power Output:
<http://forums.qrz.com/index.php?threads/yaesu-ftdx-1200-low-power-output.432683/>
- Wouxun KG-UV950P distorted output: <http://www.eham.net/reviews/detail/11587>

We are always looking for additional net control operators. If you would like to participate we can help you with the basics of becoming a net controller. This is a great opportunity to learn and get experience running a net.

Net controllers are always needed to perform Emergency Communications services. In the event of emergencies such as floods, fires, or other public service, the amateurs radio community is always ready to help. If you have an interest in participating, when the need arises, learn and train now to be prepared. For additional information contact our EmComm Coordinators: Mike Vespoli (KE0HFH) and Brennan Pate (AD0UZ), at emcomm@w0tx.org.

Great topics from our group. We certainly enjoy everyone's participation. Thanks to all.

If you are listening and don't yet have your license, you can contact us via w0tx@w0tx.org or elmer@w0tx.org.

If we don't have the answer here on the net, we have a lot of experienced hams in the club that can help. Questions can also be submitted on the YAHOO Learning Net web page <https://groups.yahoo.com>. Here you will also find information from past activity that you might find of interest.

Getting that first Technician license? Upgrading to General or Extra? We're here to help. We would encourage those who have been Hams for several years to also join us. Your experience and input is welcomed. What topics would you like to discuss? Join us Wednesday nights, 7:30 PM, 145.490 / 448.625.

(Note: The third Wednesday of the month is devoted to the DRC club meeting. See the [W0TX web site](#) for additional information.)

73,

Fred
AA0JK

**Don't forget to join in on Wednesday nights at 7:30 p.m. for the
DRC Learning Net on the 145.49/448.625 (no PL) repeaters!**

MY HAM RADIO STORY

BY ALEX ACERRA, W2PBR

What is your ham radio story?

In sixth grade a friend and I took a technician licensing course. Once licensed, most of our activity consisted of taking our handhelds on the school bus to test the coverage of the local college's repeater. We also figured out the autopatch on that repeater, and occasionally one of us would randomly call the other's house. My father was kind enough to let me install a 2m/70cm yagi with antenna rotator on our chimney, and I picked up a 35 watt amp and power supply for a base station. When my awesome VHF set up only got my signal about 30 miles, rather than the next state over, I was disappointed. I didn't have an elmer, and my local net mostly discussed house maintenance and car repair. Being 12, I didn't relate, and soon enough my attention turned to other things.

A few years ago, another friend got her tech license and I was inspired to move up to general and get reacquainted with the hobby. I have to say that discovering the W0TX.org website with its list of local nets was a real reason that I was able to jump back in so quickly. Finding that information made it easy to start listening and eventually checking-in to nets, and ultimately to getting back into operating. And, after months of hearing stations that were calling outside my HF privileges, I decided to upgrade to extra.

What are your favorite activities in the hobby?

My favorite activity is probably chasing DX. The antenna I use is quite modest – it's just a dipole up in two trees outside of my apartment. Obviously that's not ideal for chasing DX, but it is a real thrill to add a new entity to the log. I would say that most of my radio time is spent operating on HF. But, I also very much enjoy checking in to the club's learning net. Most of the folks I know in the club I met through the learning net.

What is your most memorable experience(s)?

Two months after I had gotten my first HF rig, I woke up very early one Saturday morning and decided to turn on the radio. It was tuned somewhere in the phone portion of 20 meters and I heard a station with an F-callsign calling CQ. At the time, my furthest contact was Canada, so you can imagine this was surprising. I got the contact and kept moving up the band - I couldn't find an unused frequency! There were foreign callsigns all over the place. I had no idea what was going on, but I spent the entire day contacting every foreign station I could. Turns out I had stumbled into the ARRL International DX Contest. For someone with limited HF experience, it was quite the event.

What is your background?

My professional background is not in engineering or electronics. I received a BA in Government, got an MA in Latin American Studies, and like many humanities/social sciences graduates, ended up going to law school and becoming an attorney. One of my favorite things about upgrading to general and then extra was that I had to relearn math and science that I had long forgotten and don't use on a daily basis. It was refreshing to exercise that part of my brain.

What are your additional hobbies?

I enjoy snowboarding, playing soccer, camping, and I am trying to learn how to cook. In college, I was a DJ on the student radio station and worked as a DJ at a bar, but I haven't yet had the opportunity to relive those glory days.

[Editor's note: If you would like to have your ham radio story published in the RT, please send it over to drc.editor@gmail.com. We can always embellish details if you feel your life is way too boring for our audience. Just kidding. Everyone has an interesting story.]

SOLAR UPDATE

PROVIDED BY Fred Hart, AA0JK



Week One

September Starts Out With Seven Sizable Solar Flares.

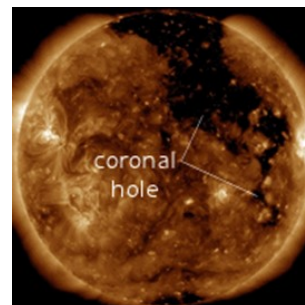
September 4th thru 10th, NASSA's solar Dynamics Observatory Satellite captured them all. (<https://twitter.com/i/moments/907273895056732160>)

September 1st: A Busy Week For Solar Activity.

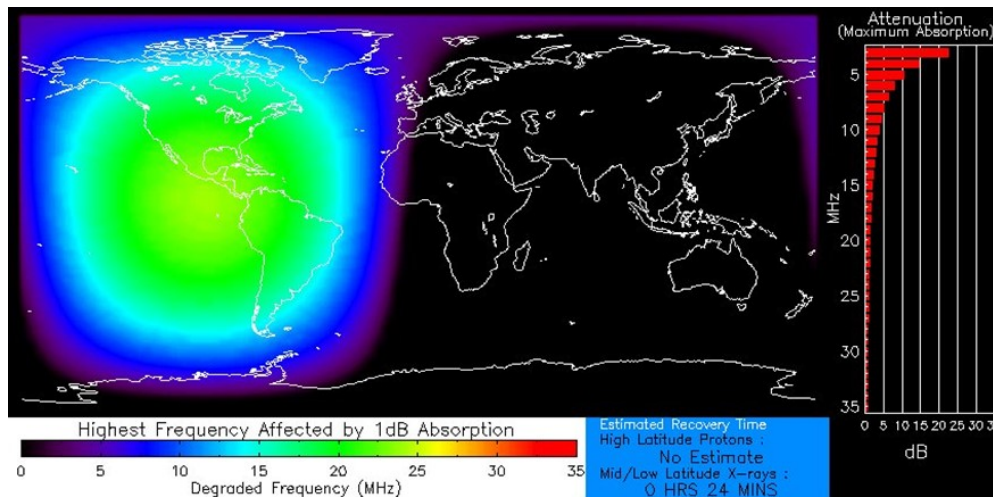
Earths magnetic field was unsettled as it passed through a fast-moving solar wind stream. A CME fragment was expected to re-ignite a G1-class geomagnetic storm.

The solar wind stream was moving past Earth at above 600 km/s. A minor (G1) geomagnetic storm was in progress.

Radio Blackout:



Earth was inside a stream of solar wind flowing from the indicated coronal hole. Credit: NASA/SDO.



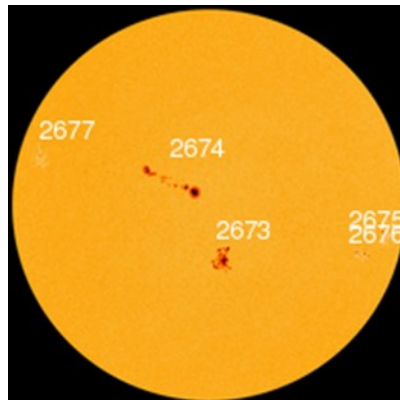
Minor X-ray flux
Product Valid At : 2017-09-04 18:22 UTC

Normal Proton Background
NOAA/SWPC Boulder, CO USA

(Continued on page 7)

No Post-Eclipse Rest for this Sun. Tamitha Skov: <https://youtu.be/qvijFpRMQpY>

September 4th, Sunspot AR12673 formation was growing rapidly both in size and magnetic complexity. Solar activity was at low levels.

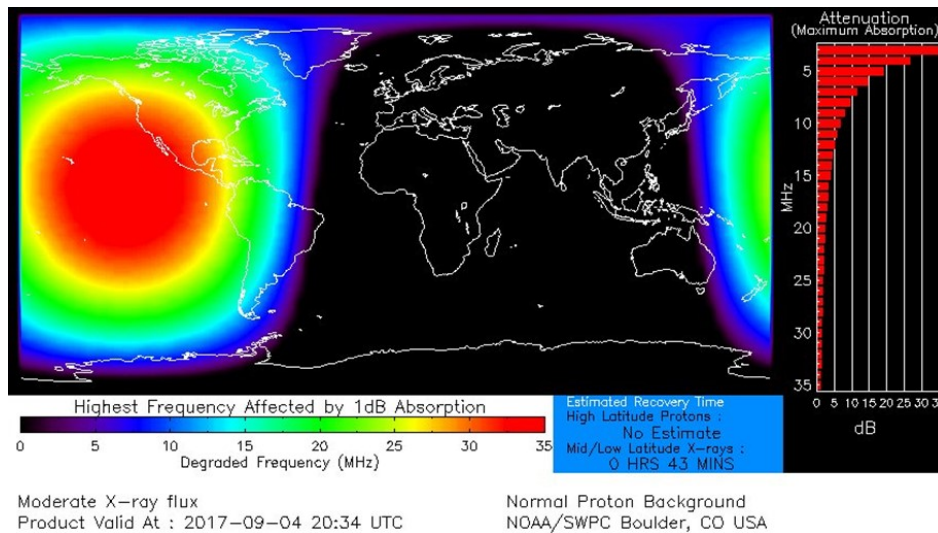


Fast-growing sunspot AR12673 was a "beta-gamma" magnetic field that harbored energy for M-class solar flares. Credit: SDO/HMI.

SUNSPOT SURPRISE: What a difference a day can make. On Saturday, September 2nd, Sunspot AR12673 was an unremarkable speck largely ignored by forecasters. On September 3rd, it underwent a furious transformation.

September 3rd: SUNSPOT SURPRISE: Two huge sunspot groups were facing Earth. Behemoth AR12674 had been growing for days, while newcomer AR12673 was suddenly quadrupled in size, with multiple dark cores breaching the surface of the Sun in just 24 hours.

Moderate R2 radio blackout:



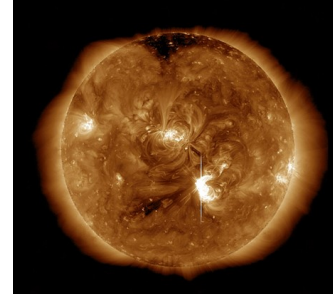
Numerous radio black-out conditions followed throughout the week as the Earth rotated into line with solar activity. Flares, solar winds, all hit at a time that could not have been worse. Communications during the Hurricane events were severely degraded. One county in Florida was requesting help from the amateur radio community, due to all other means of communication having failed.

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Ham Radio Operators Needed: Due to communication disruptions, Amateur Radio Operators were called upon during Hurricane Irma.

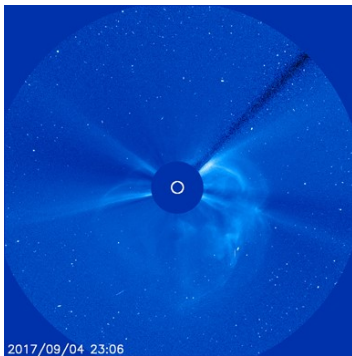
(Pasco Co. needs ham radio operators http://www.rightrelevance.com/search/articles/hero?article=d2a507374b20df1f23d004a0ab515e1875753c8d&query=ham%20radio&taccount=hamradio_rr)



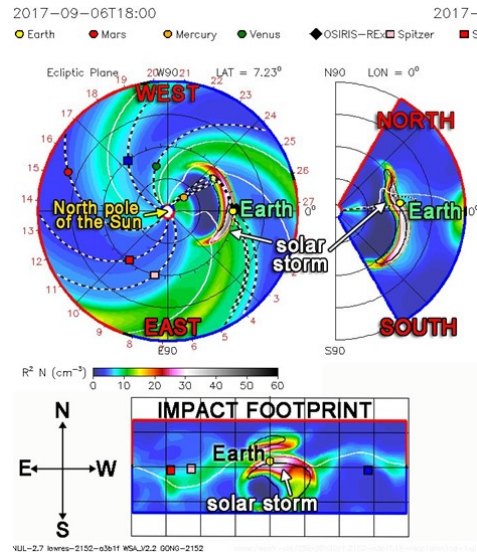
Credit: NASA/SDO.

A M5.5 solar flare event around region AR12673. The flare was associated with a Type II radio emission with an estimated velocity of 1472 km/s, along with a 10cm radio burst (TenFlare) lasting 52 minutes and measuring 1600 solar flux units (SFU). Low energy proton levels as measured by the GOES-13 spacecraft were on the rise. Updated chronograph imagery courtesy of LASCO C3 shows a coronal mass ejection (CME) leaving the sun and at least a portion of this cloud was expected to be Earth directed.

Coronal Mass Ejection (CME) leaving the Sun



2017/09/04 23:06
Strong M4.21 solar flare from sunspot region AR12673. Credit: SOHO / NASA

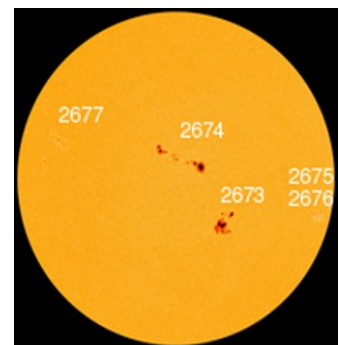


Dr. Tamitha Skov [@TamithaSkov](https://twitter.com/TamithaSkov): Direct hit! NASA prediction model showed solar-storm launching a hit on Earth late on September 6th! Expecting numerous ham radio, and GPS issues to follow.

September 5th: A FURIOUS TRANSFORMATION: What a difference a day can make. On September 2nd, sunspot AR12673 was an unremarkable speck, largely ignored by forecasters. On September 3rd it underwent a furious transformation.

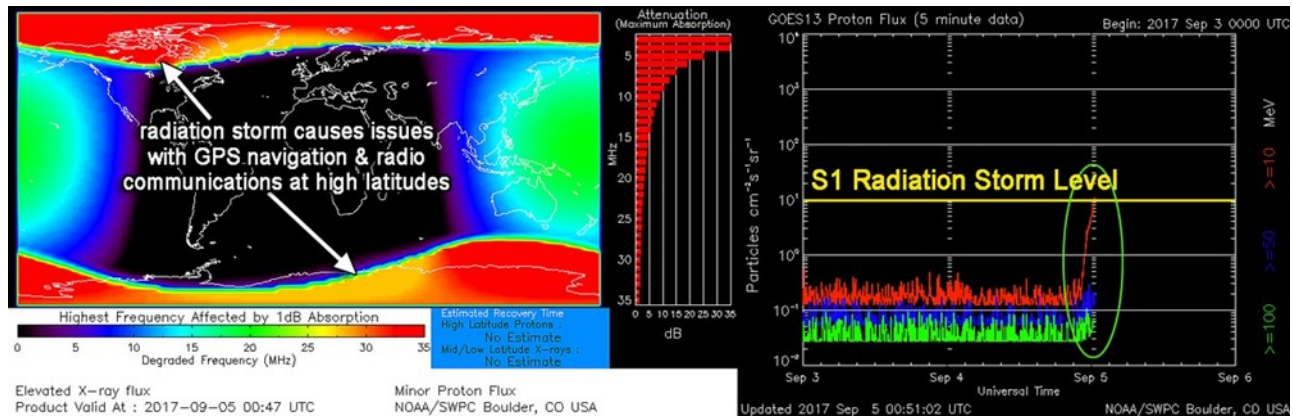
AR12673 expanded more than 10-fold in a single day, suddenly becoming one of the largest sunspots of the year.

The behemoth sunspot was continuing to grow and on September 5th, it was a 'beta-gamma-delta' magnetic field that harbored energy for X-class solar flares. Any explosions would be geoeffective as the active region was directly facing Earth. Possible outcomes included strong HF radio blackouts, disruptions to GPS, and communication satellites. Earth-directed CMEs and geomagnetic storms were expected later in the week.



Sunspot AR12673 had a "beta-gamma-delta" magnetic field that harbored energy for X-class solar flares. Credit: SDO/HMI

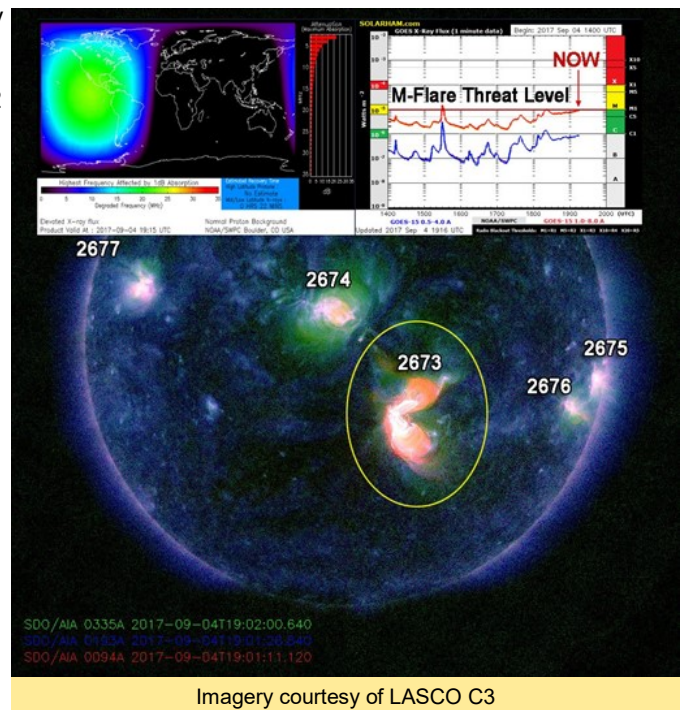
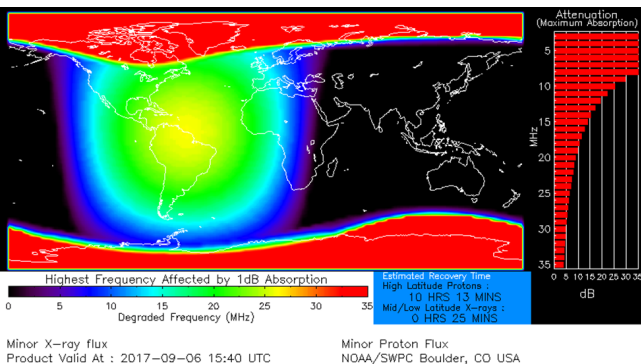
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Radio Blackout



A M5.5 solar flare event around region AR12673 Monday evening at 20:33 UTC. The flare was associated with a Type II radio emission with an estimated velocity of 1472 km/s, along with a 10cm radio burst (TenFlare) lasting 52 minutes and measuring 1600 solar flux units (SFU). Low energy proton levels were measured by the GOES-13 spacecraft were on the rise.

Proton levels continued to rise following the eruption around AR12673. A minor (S1) radiation storm was in progress.

September. 6th: Radio Blackout



Flares resulted in radio blackouts: High-frequency radios experienced a "wide area of blackouts, loss of contact for up to an hour over the sunlit side of Earth," and low frequency communication, used in navigation, were degraded for an hour."

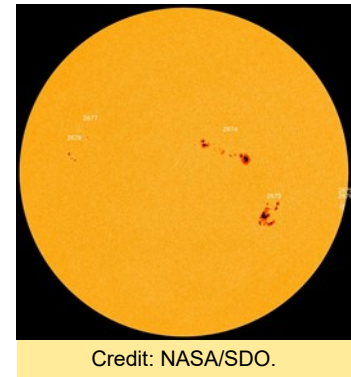
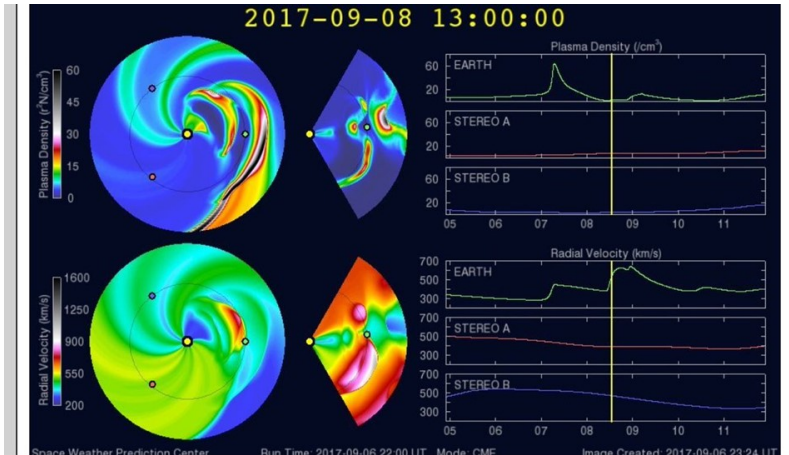
Dr. Tamitha Skov: We were in a X9.3-flare! Largest of this solar cycle! Massive Ham Radio blackouts. GPS issues also on day-side of Earth.

Sun Unleashes Monster Solar Flare, Strongest in a Decade: Early morning of September 6th, the sun released two powerful solar flares — the second was the most powerful in more than a decade.

At 5:10 a.m. EDT (0910 GMT), an X-class solar flare — the most powerful sun-storm category — blasted from a large sunspot on the sun's surface. That flare was the strongest since 2015, at X2.2, but it was dwarfed just 3 hours later, at 8:02 a.m. EDT (1202 GMT), by an X9.3 flare, according to the National Oceanic and Atmospheric Administration's Space Weather Prediction Center (SWPC). The last X9 flare occurred in 2006 (coming in at X9.0).

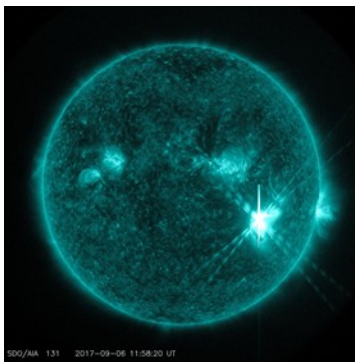
According to SWPC, the flares resulted in radio blackouts: high-frequency radio experienced a "wide area of blackouts, loss of contact for up to an hour over the sunlit side of Earth," and low frequency communication, used in navigation, was degraded for an hour. <https://www.space.com/38057-sun-unleashes-decades-strongest-solar-flare.html>

September 7th

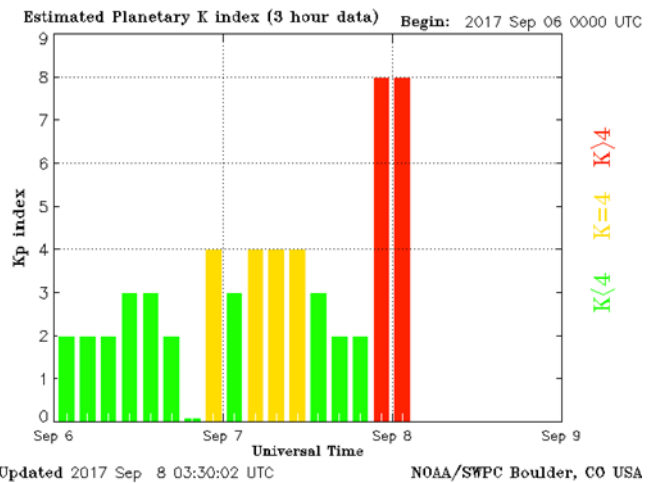


Credit: NASA/SDO.

Biggest flare in solar cycle 24! And as we approach solar minimum!

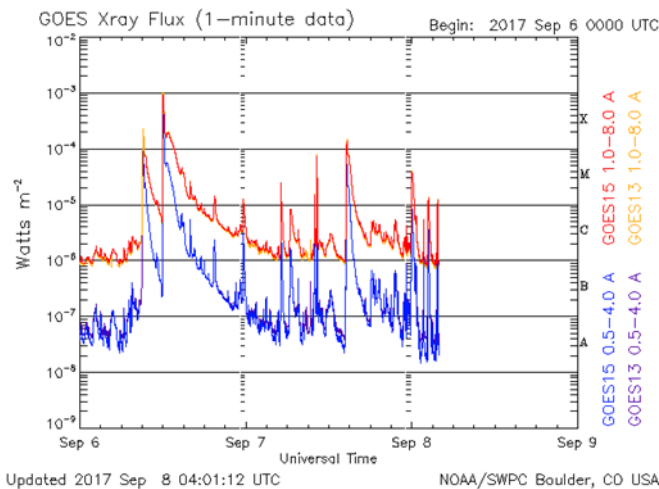


Credit: NASA/SDO.



Updated 2017 Sep 8 03:30:02 UTC

NOAA/SWPC Boulder, CO USA



Updated 2017 Sep 8 04:01:12 UTC

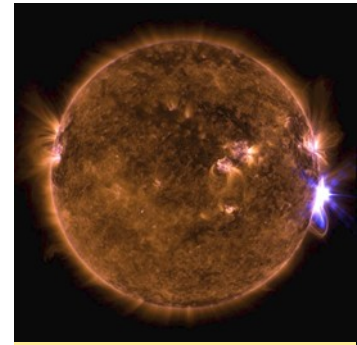
NOAA/SWPC Boulder, CO USA

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Week Two

September 10th

Our Sun erupted with an impressive solar flare--classified as X8.2--on Sunday: <https://youtu.be/ybfAvEVpBMo>. This video shows the September 10th X8.2-class solar flare as observed by NASA's Solar Dynamics Observatory. The video shows a blend of light from the 171- and 304-angstrom wavelengths. The static at about 24 seconds into the video is caused by particles from the Sun striking the instrument. Credits: NASA/Goddard/SDO

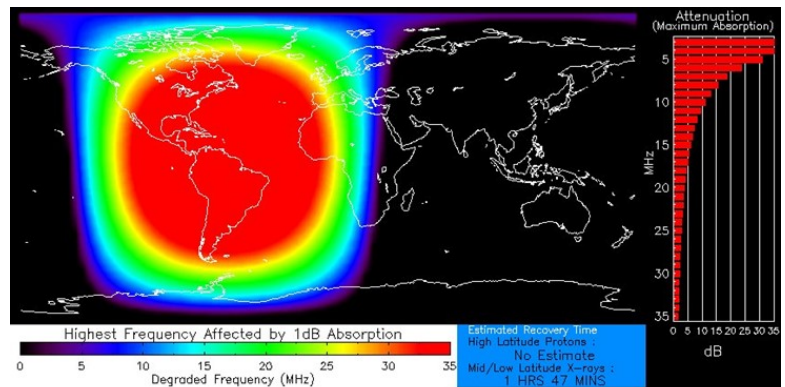


Credit: NASA/SDO.

GOODBYE SUNSPOT, SEE YOU IN 2 WEEKS: Sunspot AR12673 materialized with shocking speed on September 3rd. Three days later it unleashed the strongest solar flare in more than a decade, an X9.3-class eruption that hurled a CME directly at Earth. Now this memorable sunspot is about to disappear.

Radio Blackout: Sunspot region AR12673 - X9.3 and X8.2 solar flares! <https://youtu.be/gWTzNe436iw>

On 28 August 2017, Active Region AR12673 rotated onto the earth-facing solar disk. At the time it was a simple Alpha region with only one sunspot. On 2 September 2017 it started to grow very rapidly and within 48 hours it became one of the most complex sunspot regions of Solar Cycle 24. Sunspot region AR12673 was responsible for 27 M-class solar flares, 4 X-class solar flares and a severe G4 geomagnetic storm. It produced the two strongest solar flares of Solar Cycle 24: X8.2 and X9.3.

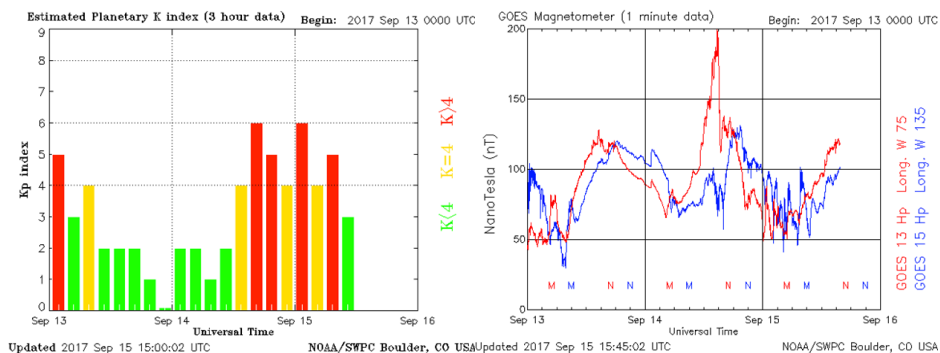


The solar storm of 1859 (also known as the Carrington Event) was a powerful geomagnetic solar storm during solar cycle 10 (1855–1867). A solar coronal mass ejection hit Earth's magnetosphere and induced one of the largest geomagnetic storms on record, September 1–2, 1859.

Hit during solar minimum: If AR12673 would have been a direct hit, would it have been the equivalent to the storm of 1859? We have seen what a glancing blow can do, what would it have done to the grid if it had been a direct hit? The Carrington event storm was only one of several that took place in 1859 during their solar minimum of cycle 10. Are we ready for another AR12673 Flair during our present cycle 24?

Solar disruptions of Communications, Power outages, Amateur Radio Operators turn to their Go-Box to provide emergency communications. Hurricane Irma - AE4FH Checking Into the Hurricane Watch Net and Giving a Report: https://youtu.be/cttoY39om_g

September 15th: A high speed solar wind stream continued to move past our planet and was responsible for periods of minor to moderate geomagnetic storming at higher latitudes.



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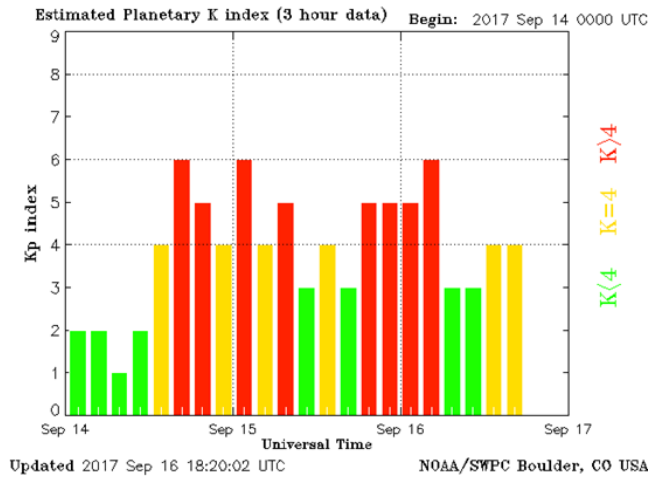
September 16th: Solar Wind Storm: The solar wind around Earth was blowing faster than 650 km/s. An electrified gale that was sparking G1 and G2- class geomagnetic storms.

Week Three

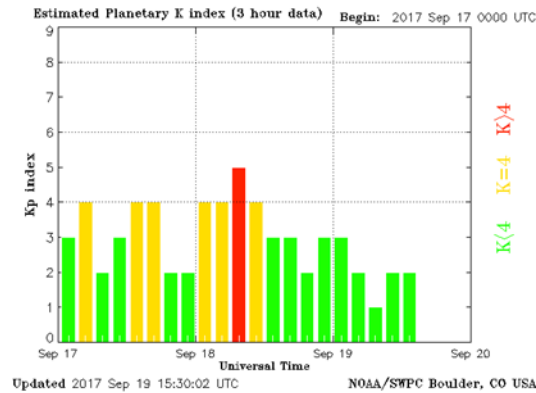
Far-side eruption of AR12673. STEREO captured a view of the CME. This being on the backside of the sun, we were not effected. The active region was still a week away from returning back into Earth view.



Image courtesy of SDO/HMI.



September 18th: SOLAR WIND STORM: Earth was inside a stream of solar wind blowing faster than 550 km/s. As a result, NOAA forecasters reported there was a 40% chance of G1-class geomagnetic storms.



September 22nd: Autumn Equinox

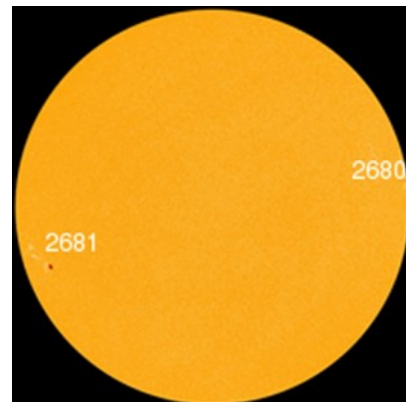
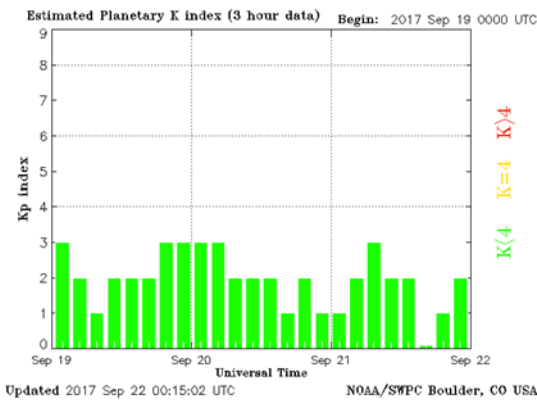
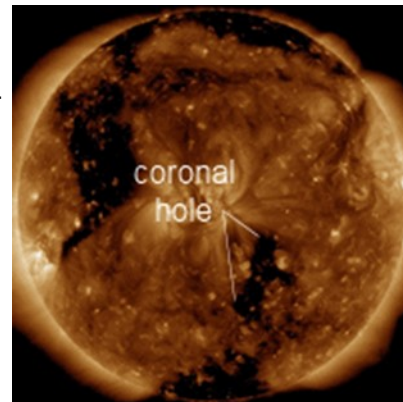


Image courtesy of SDO/HMI.

Sun spots AR12680 and AR12691, pose no threat of strong solar flares.

September 23rd: SOLAR WIND STREAM APPROACHES EARTH: A hole in the sun's atmosphere was spewing solar wind toward Earth. Traveling faster than 600 km/s (1.3 million mph), the solar wind was expected to reach our planet on September 24th, bringing a 40% chance of polar geomagnetic storms according to NOAA forecasters. The chance of storms rose to 50% on the following day, September 25th as Earth moved deeper into the stream.



Solar wind flowing from this coronal hole was expected to reach Earth on September 23-24. Image courtesy of SDO/HMI.

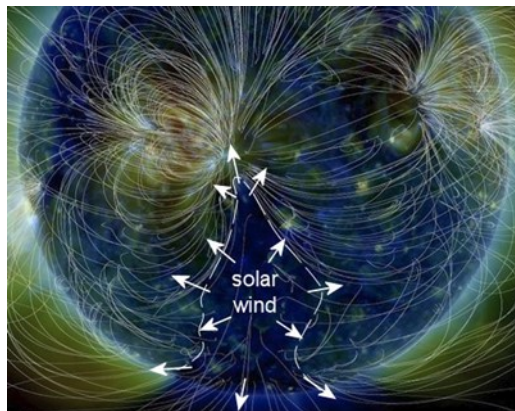


Image courtesy of SDO/HMI.

Week Four

September 24th: Solar activity was at very low levels, and no noteworthy solar flares to report. Region AR12673 was due to reappear back into view. STEREO imagery showed that the region remained stable. Major X-Flares were not expected.

CO-ROTATING INTERACTION REGION: NOAA forecasters estimate a 40% chance of polar geomagnetic storms on September 24th when a co-rotating interaction region (CIR) was expected to hit Earth's magnetic field. CIRs are transition zones between slow- and fast-moving solar wind streams. Solar wind plasma piles up in these regions, producing density gradients and shock waves that do a good job of sparking HF radio interference.

A POTENT SUNSPOT IN THE OFFING? In early September, monster sunspot AR12673 emerged with shocking speed, and proceeded to unleash a pair of decade-class solar flares. The resulting severe geomagnetic storms reeked havoc with HF, communications, GPS, and satellite communications. Now, the sunspot is coming back. The bright loops in this photo from NASA Solar Dynamics Observatory heralded its approach:

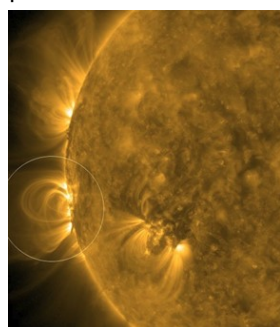
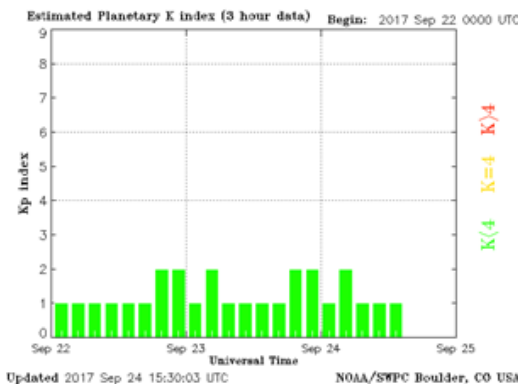


Image courtesy of SDO/HMI.

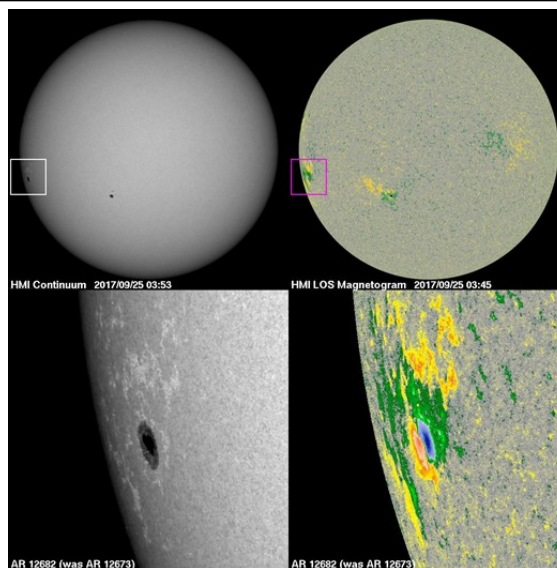
For the previous two weeks, AR12673 was transiting the backside of the sun, carried around by the sun's 27-day rotation. It was due to return. The loops, shown above, trace the AR12673's towering magnetic canopy, coming into view before the sunspot itself. Would it be as potent as before? Hopefully not, but stay tuned!

September 25th: AR12673 produced notable solar-terrestrial events in early September. It is back as AR12682, but may no longer be as exciting as before.

Forecast:
Solar activity is expected to be at very low levels. There is a chance for C-class flare activity, and a slight chance for M-class flare activity, due mostly to the flare potential of Region AR12683.

73,

AAØJK
Fred



FALL TECHFEST

By JED BAER, KD0YMG

I wanted to let everyone know about the upcoming Fall TechFest, produced by the 285 TechConnect Radio Club - NA0TC. The TechFest is an annual event with 5 hours of presentations on technical topics related to amateur radio, plus a "demo corner" where club members show off some of their operating technology. The TechFest will be held Saturday, Nov 11th, at the Lakewood Elks Lodge at 1455 Newland Street in Lakewood, CO. Please visit the following websites for additional information.



Club website is: <http://na0tc.org/>
TechFest page: <http://na0tc.org/doku.php?id=techfests>
Flyer: http://na0tc.org/lib/exe/fetch.php?media=club:2017_fall_techfest_flyer.pdf

LOOKING FOR CLUB MEETING PRESENTATIONS

By BILL RINKER, W6OAV

Please contact W6OAV if you have an idea for a club presentation, or know of someone who would be willing to give a presentation.

ATTENTION

The DRC Board of Directors meetings are held on the 4th Wednesday of the month and are open to any member. Due to scheduling of meeting space, the board does not always meet at the same location and on occasion meetings are held via Skype. Anyone wishing to attend, please contact a board member prior to meeting night for specific information.

SUPERCHARGE YOUR MD380/MD390 DMR HT

By BILL RINKER, W6OAV

The Tytera MD380/MD390 DMR/ HTs are one of the best buys today. They are inexpensive, pack many features such as superb transmit and receive audio, good receive sensitivity, rugged construction and many features such as front panel key pad programming. The MD380 is probably the most common HT on the DMR network! It is certainly popular with DRC members! A good review can be found at www.va3xpr.net.

However, even with all its great features, there is a firmware update that makes the MD380/MD390 the most powerful HT out there. The update is called TyMD380toolz. TyMD380toolz, developed by KG5RKI, is a modification of the original TyMD380tools developed by Travis Goodspeed, KK4VCZ, and many others. TyMD380toolz adds many new and powerful features to the "standard" MD380/MD390. KG5RKi's website (<https://kg5rki.com>) provides all the necessary software, documentation and a Tytera Flash Tool which makes the update extremely simple. An overview describing installing the update is at the end of this article.

TYMD380TOOLZ FEATURES

This section describes only the most popular features provided by TyMD380toolz. All features are described at https://kg5rki.com/MD380_AIO/TyMD380Toolz.pdf

Worldwide DMR MARC Database Access

This feature is the most popular. A standard MD380/MD390 compares an incoming DMR ID to listings in its Contact List. If the Contact List contains a call sign listing for the incoming DMR ID, that call sign is displayed. If there is no listing, only the incoming DMR ID displays. There is no way to program all the world's DMR users' IDs into the Contact List! However, TyMD380toolz solves this problem. TyMD380toolz stores the entire DMR MARC ID database in the MD380/MD390 allowing the HT to display the Talk Group, Time Slot well as the name, call sign and location of the remote station. Figure 1 shows an actual screen. Pretty cool!

Promiscuous Mode

Promiscuous Mode allows the MD380/MD390 user to hear any active Talk Group on a Time Slot, even though the Talk Groups are not programmed in the Code Plug. The Talk Group number is displayed on the HT's screen. Should the user desire to join the Talk Group that he's hearing even though it is not programmed in his Code Plug, he can depress a single key pad to automatically transfer the MD380/MD390 to that Talk Group. When he is done, he can depress another key pad to transfer the MD380/MD390 back to the original programmed Talk Group.

Key Pad Programming

New menu items allow for key pad programming to modify Code Plug parameters eliminating the need to use a laptop. For example, if the user wants to access a different DMR repeater he can, using the key pad, reprogram the necessary Time Slot, Talk Group, Color Code, frequency, etc. A Color Code scan function can be used to determine the repeater's Color Code. There are many more Code Plug parameters that can be modified using the key pad, such as side button functions, channel management, zone management, scan management, etc.

Last Heard Displayed

When enabled the last heard call sign and Talk Group is displayed where the date/time is normally displayed at the bottom of the display.

UPDATING THE MD380/MD390 FIRMWARE WITH TYMD380TOOLZ

This section is not a tutorial. The purpose of this section is to demonstrate the simplicity of updating the MD380/MD390 firmware using the Tytera Flash Tool.

Figure 1 (following page) shows how simple the Tytera Flash Tool is to use. After connecting the programming PC, powering up the MD380/MD390 in the "Install firmware mode" and bringing up the Tytera Flash Tool, only the following four steps need to be preformed:

- 1.) Click on "Download Non-GPS Firmware" which downloads TyMD380toolz.
- 2.) Click on "Flash" which updates the MD380/MD390 firmware.
- 3.) Click "Download Update" which downloads the DMR MARC user ID database.
- 4.) Click "Flash" which uploads the DMR MARC ID user database into the MD380/MD390.

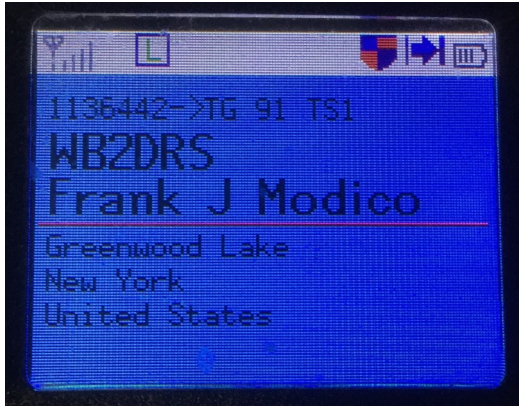


Figure 1

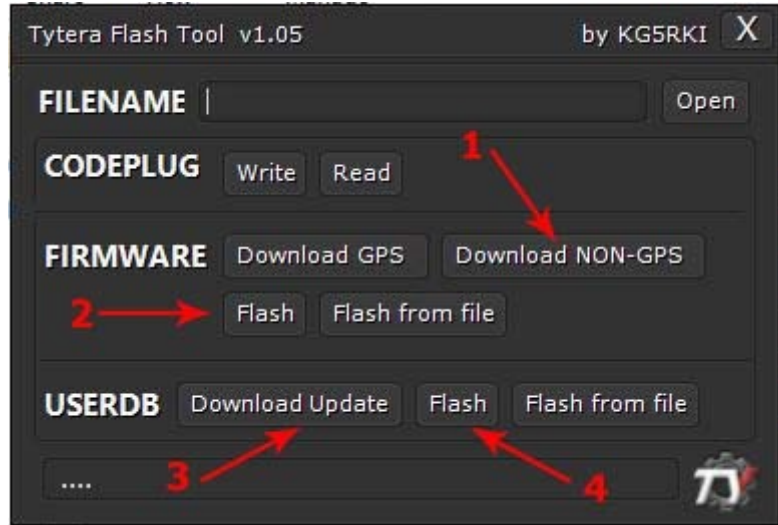


Figure 2

To activate the special ID display shown in Figure 2, to the right, use the key pad to access the MD380Toolz menu. Then access "Show Calls" and enable "User DB".

That's all there is to it! Once done, you'll have an extremely powerful HT!

References:

Description of features and menus

https://kg5rki.com/MD380_AIO/TyMD380Toolz.pdf

<http://md380.tools/features/>

<http://md380.tools/menu/>

Description of installing MD380toolz and of the menu features.

<http://www.miklor.com/DMR/DMR-380-Toolz.php>

YouTube - TYT MD380/MD390 Experimental Firmware Features Explained: <https://www.youtube.com/watch?v=NpnP9qOil14>

CALLING ALL ELMERS

AS REQUESTED BY TOM KOICIALSKI, KC2CAG

We recently received a request from a person who is new to the area and is interested in obtaining his technician license. He has been reading through the ARRL manual and is stumped by a few things and would like some help from any Elmers that can lend a hand. If you would be willing to contact the individual, please contact Tom and/or send an email to the editor (drc.editor@gmail.com) and we will get you in touch with the future ham. Thanks in advance!

~ GET PUBLISHED ~

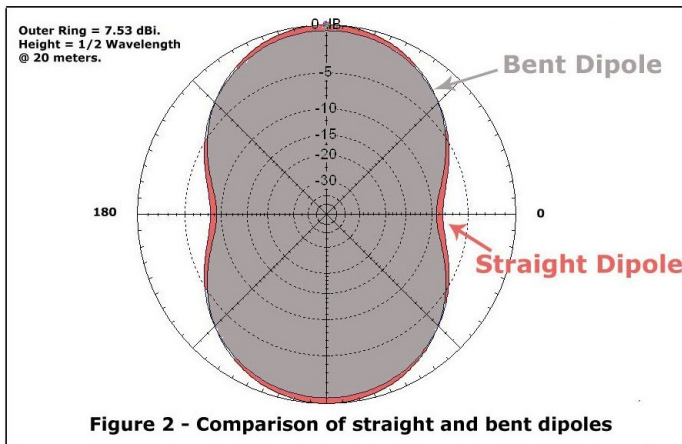
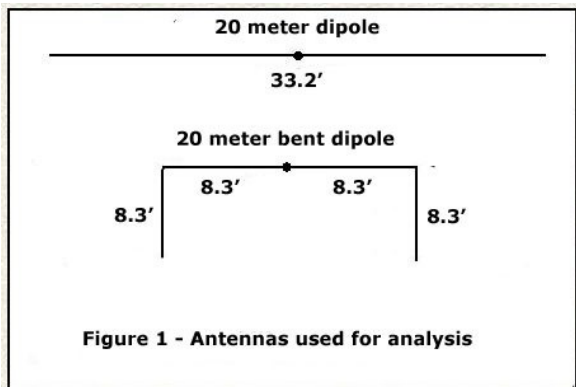
We welcome and encourage all members to share their experiences and stories so that we can all learn from one another. It can be long or short. If we can't fit it into one newsletter, we can split it across multiple issues. Not a writer? We have volunteers that will listen to your story and put it into an article, and of course you will have the opportunity to review and approve prior to publication. Your contribution to the club is welcomed and appreciated. ~Editor

DON'T LOAD IT, BEND IT!

BY BILL RINKER, W6OAV

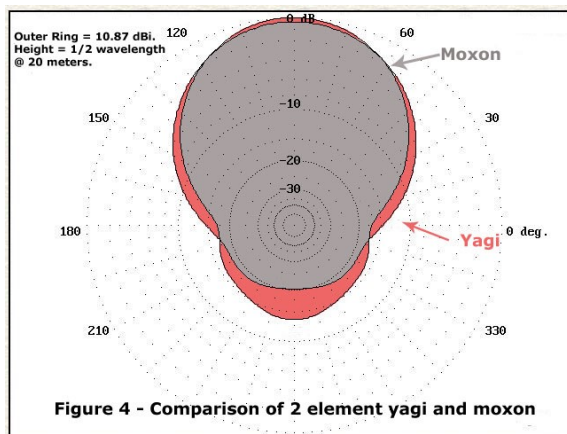
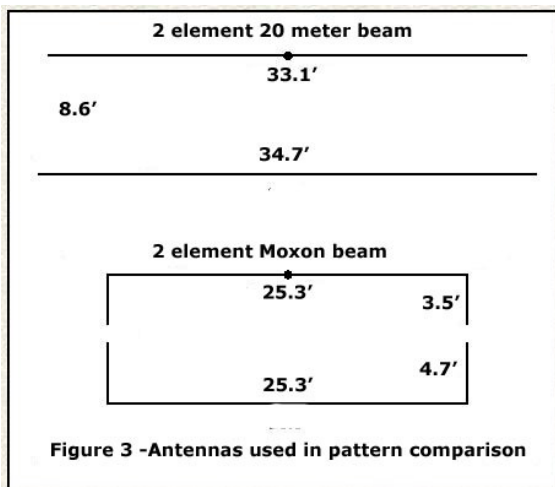
In years past I've used loading coils, which by nature have loss, to shorten an HF dipole in order to fit it into my lot. Then, one day I read that one can bend the ends of a dipole up to 90 degrees and up to 50% from each end and lose only 0.6 dB (May 1977 QST). This sure sounded better than using lossy loading coils! However, this sounded too good to be true! So, before installing a bent HF dipole I decide to research this configuration to see if it were really true.

I began the research by using EZNEC to model the two 20 meter antennas shown in Figure 1 at 30' above ground. Figure 2 shows the results. The gray pattern is that of the bent dipole and the red pattern is that of the straight dipole. This comparison agrees with the numbers presented in the QST article. So, knowing that there can be a difference between theoretical and actual values, I decided to build, tune and test 2 meter versions of these dipoles.



The tests took place on a clear hill top about 10 miles from Dick, W0THU. Dick lives on a hill top and was line of sight to the test hilltop. Dick used a horizontal 2 meter beam pointed towards the test site. The test antennas were mounted, one at a time, on the top of a 15' fiberglass post supported by a roof mount tripod. 10 watts was applied to each test antenna while Dick measured the receive signals on a calibrated receiver as the antenna were rotated. The patterns, as measured by Dick, agreed with the theoretical patterns!

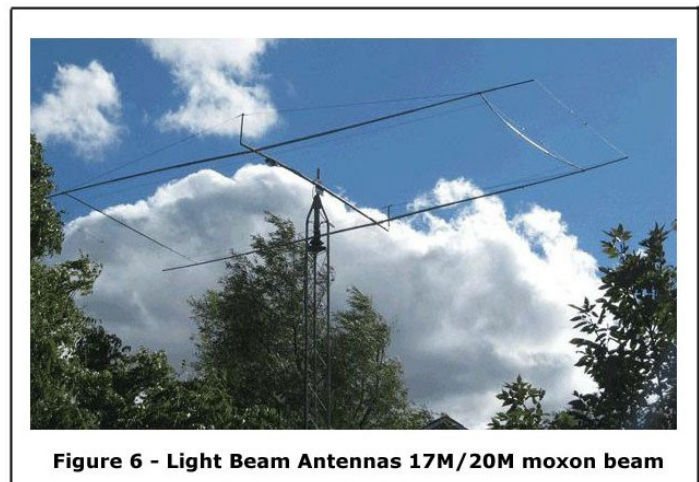
So, if bent dipoles are so efficient, are they sold commercially? Yes, they are. Some companies sell rotatable bent dipoles and others sell a bent two element beam called the Moxon. Figure 3 shows a typical 20 meter Moxon beam compared to a standard 2 element 20 meter beam. Figure 4 shows the EZNEC patterns for both antennas. Just as in the case of the bent dipole versus a straight dipole, the efficiency of the Moxon is very close to that of a standard 2 element beam.



The following is not an endorsement of the antenna manufactures used in the following discussion. They are mentioned as examples of commercial bent dipole configurations.

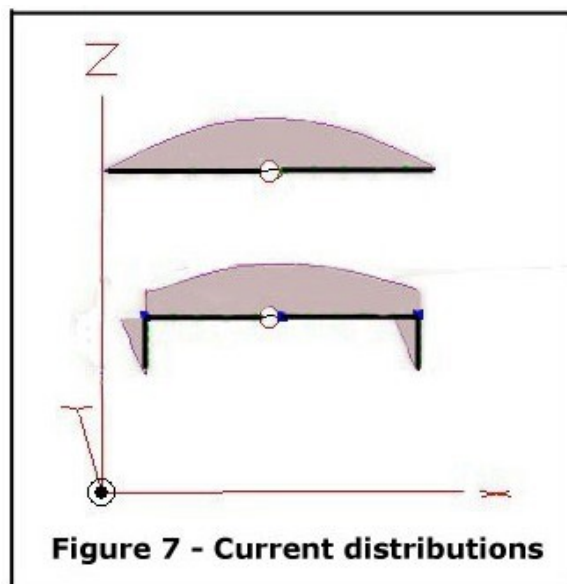
InnovAntennas sells a rotatable bent dipole 10/15/20 meter array called the DESpole (Figure 5). Note that the 15 meter and 20 meter dipoles are bent down. The horizontal length of the 20 meter dipole is 20.4' and the vertical length is 8'. The dipoles are listed at 98.5% efficient. This equates to a loss of less than a tenth of a dB over a straight dipole. This agrees the figures shown in Figure 2.

Light Beam Antennas sells a 17M/20 meter Moxon beam (Figure 6). The width of the 20 meter elements are 25.25' with the remainder of the elements bent inwards. The 20 meter gain is listed as 10.21 dBi. This agrees with figures shown in Figure 4.



Why does bending a dipole not sufficiently decrease radiation efficiency? Well, most of the RF current occurs between the dipole's center and out to about 50% from the center. Figure 7 shows the current distributions of a straight and a bent dipole. It is the current that creates the radiated RF field. Since the current is minimal in the bent portions they do not contribute much to the radiated RF field.

So, if a dipole, or 2 element beam, doesn't fit your lot, bend it. The bends can be horizontal or vertical. Just don't bend the wire more than 90 degrees.



LOOKING BACK AT THE DRC, PROVIDED BY WOODY LINWOOD (W0UI)
August 1965 - DRC's officers, board members and a couple monthly advertisers

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 VOLUME XI NUMBER 8
 PUBLISHED MONTHLY BY THE
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Words are from the Technician license manual. The solution for the puzzle is on the next page.

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 D E S M N M E T E O R E O
 T L E E O M A D R A T E O
 R E T E M O I T N E T O P
 G E R L I O N I Z I N G O
 A E E E A S I A R T H T O
 S N P T L I N K E D R I A
 I T M A O T E R R R I B P
 N S U D A P Y E K T O I R
 E C J A L A N I M R E T S
 R O T A N I M I R C S I D

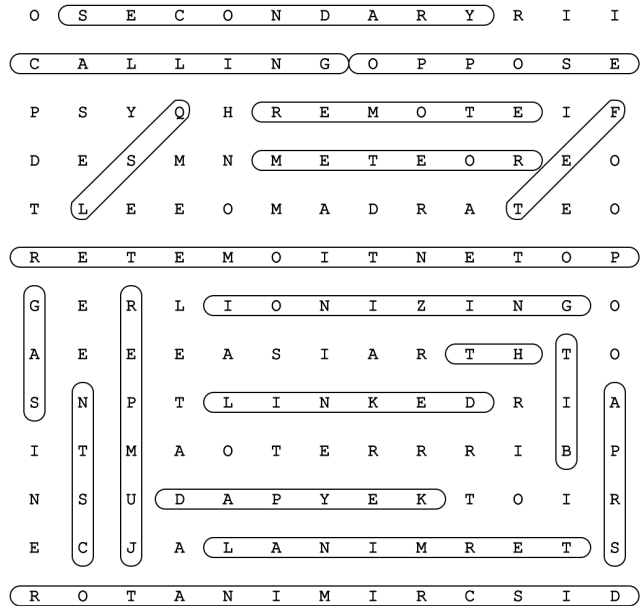
Word List:

- | | | | |
|--------|-----------|---------------|---------------|
| APRS | BIT | CALLING | DISCRIMINATOR |
| FET | GAS | HT | IONIZING |
| JUMPER | KEYPAD | LINKED | METEOR |
| NTSC | OPPOSE | POTENTIOMETER | QSL |
| REMOTE | SECONDARY | TERMINAL | |

FACT OF THE DAY

Folded Unipole Mounting Advantages

It is necessary to insulate the bottom of a base-fed tower. There are several problems associated with that. 1) An insulator must be used below each leg of most self-supporting towers. 2) Base insulators must be strong, because they have to support the weight, side-thrust, twisting, leaning and mechanical vibrations of a tower. 3) Insulators that meet those requirements are relatively expensive. 4) If a base insulator fails mechanically, a tower may fall. 5) Broken base insulators can be difficult to replace. 6) Lightning strike and induction currents do not have the shortest or safest possible path to ground. The folded unipole alternative greatly reduces these problems, because one of the two adjacent conductors connects directly to ground. That can be the supporting member (a tower). The folded member must be insulated from the tower, but it can be composed of wires that are easy to insulate and support. ©2005 Martek International All rights reserved.



HAM SITE OF THE MONTH

[BrandMeister Dashboard](#)

THE ROUNDTABLE ARCHIVE

Go to: <http://www.wotx.org/roundtables.htm>

THE ROUNDTABLE ARTICLE INDEX

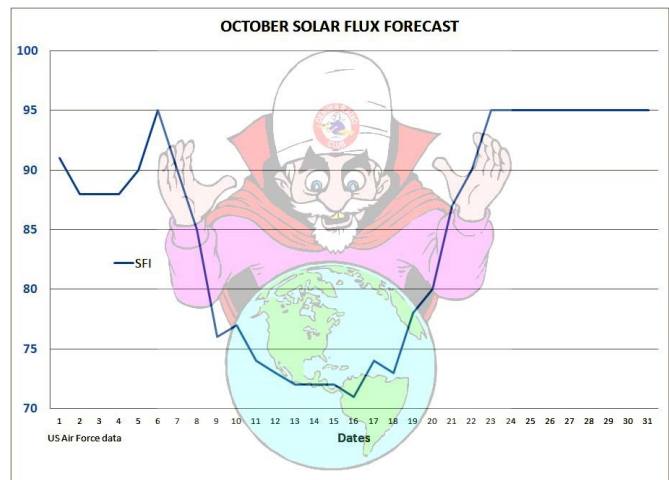
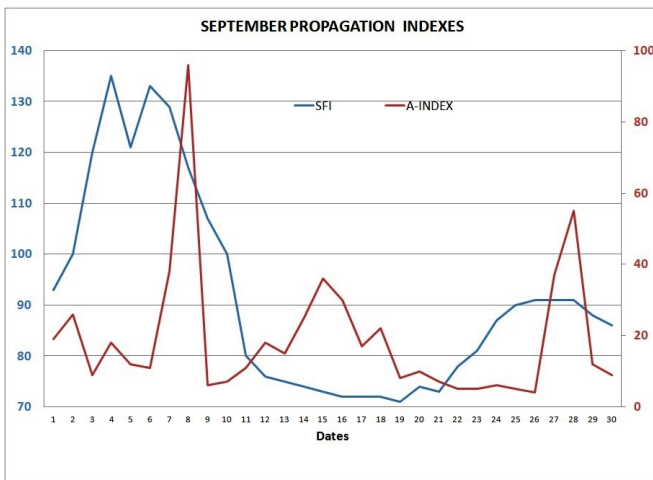
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

PAST & FUTURE PROPAGATION CONDITIONS

By Bill Rinker, W6OAV

The charts below show the Solar Flux and "A" indexes for last month and the forecast for this month's Solar Flux index.

Refer to the September 2010 *Roundtable* for more complete information on interpreting these charts. Issues of the *RoundTable* are available at [http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009\(SEP\).pdf](http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009(SEP).pdf)



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UPCOMING EVENTS
HAMFESTS & CONVENTIONS

Event	Date	Location	Sponsor Website
BARCfest	10/08/17	Boulder County Fairgrounds	Boulder ARC BARCfest
285 TechFest	11/11/17	Lakewood Elks Lodge	285 TechConnect Club

UPCOMING ARRL CONTESTS & EVENTS [ARRL CONTEST CALENDAR](#)

Contest	Start Date	Start Time	End Date	Stop Time	Notes
EME - 50 to 1296 MHz	10/07/17	0000 UTC	10/08/17	2359 UTC	
School Club Roundup	10/16/17	1300 UTC	10/20/17	2359 UTC	

UPCOMING QSO PARTIES

The following are the Contests not sponsored by the ARRL. Please submit additions for future issues.

State/Province	Start Date	End Date	Sponsor Website	Notes
California	10/07/2017	10/08/2017	California QSO Party	
Pennsylvania	10/14/2017	10/15/2017	Nittany Amateur Radio Club	
Arizona	10/14/2017	10/15/2017	ARRL Arizona Section & Catalina Radio Club	
New York	10/21/2017	10/22/2017	Rochester DX Association	
South Dakota	10/21/2017	10/22/2017	South Dakota QSO Party	
Illinois	10/22/2017	10/23/2017	Western Illinois Amateur Radio Club	
Kentucky	11/11/2017	11/12/2017	Western KY DX Association	
Montana	01/27/2018	01/28/2018	Flathead Valley Amateur Radio Club	Based on '17 date.

ATTENTION

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DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz<>14.105MHz	2 meter / 20 meter gateway. Useable by Technicians on 2 meters. See January 2015 RT.
2m	145.490MHz (-) 100Hz PL	Linked to the 70cm / 448.625MHz machine.
2m	147.330MHz (+) 100Hz PL	Local area. Has voting receivers. Does not TX a PL.
2m	147.330MHz (+) 131.8Hz PL	Test mode operation. Send signal reports to Tech Committee.
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS~073; NB 12.5; +/- 2.5	Saint Anthony's. Note: This is a narrow band repeater requiring DCS.
70cm	448.625MHz (-) 100Hz PL	Linked to the 2m / 145.490MHz machine.
70cm	449.350MHz (-) 100Hz PL	Wide area coverage with Echolink, node # 4140.
70cm	449.775 MHz (-) 100Hz PL	Yaesu Fusion Digital, Wires-X and analog. 100 Hz tone required for analog.
70cm	446.7875MHz (-)	BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804



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





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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
1	2	3	4 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	5  Full Moon	6	7 EME 50 - 1296 MHz Contest - Begins 0000 UTC	
8 EME 50 - 1296 MHz Contest - Ends 2359 UTC	9  COLUMBUS DAY	10	11 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	12  Last Quarter	13	14	
15	16 School Club Roundup - Begins 1300 UTC	17	18 DRC Meeting Elmer 6 PM General 7 PM	19  New Moon	20 10GHz & Up - Ends 2359 UTC	21	
22	23	24	25 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	26	27  First Quarter	28	
29	30	31 					

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Please Let Us Know

Over the years we occasionally hear from hams who have read the RoundTable in other states and countries around the world. We appreciate the comments and we would like to know where you are located. So if you live outside the Front Range or Denver Metro Area and read the newsletter either online, email or hard copy please send a short note via email with your *City, State or City, Country*.

We will publish it at a later date in our new regular feature called RoundTable RoundWorld.
To respond to this request send your information to drc.editor@gmail.com.

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